

# Microcosm-III

CIHR Institute of Infection and Immunity Newsletter

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## Message from the Scientific Director

### *Moving Targets*

It's been almost a year since Canada had its first SARS case. Many health experts greeted this past fall with trepidation, as the pattern of many respiratory viruses is to disappear during summer, reappearing in the fall and winter. Worldwide, influenza alone causes from 250,000 to 500,000 deaths each flu season, and no one knew what to expect from the severe acute respiratory syndrome (SARS) with new cases of SARS in China in December 2003. The January 2004 outbreak of avian influenza A (H5N1) in Vietnam is a reminder of this uncertainty and of the added burden on health care professionals and researchers controlling outbreaks in this new environment.

It is challenging to set research agendas and allocate resources to address an unpredictable target, but this was one of the reasons for the Institute's creation. With our partners in the Canadian SARS Research Consortium (CSRC), we will improve Canada's preparedness for future infectious disease outbreaks. The CSRC is helping to coordinate and implement a national research agenda addressing diagnostics, vaccine development, therapeutics, epidemiology, and public health impact.

There is an immediate need to strengthen our public health system both in research and infrastructure. We need to build research capacity and fund more basic research in infectious disease and vaccines. The recommendations from the Naylor consultation for a Canadian public health agency and more research funding are important areas for our Institute to support. In particular, there is a need to build the capacity to respond to emerging infectious disease such as West Nile virus and BSE. Toward this end, the Institute sponsored a research consultative meeting on prion diseases as reported in this edition of the newsletter. This and other meetings such as the Integrating Discovery Platforms in Autoimmune Diseases Research Symposium will allow us to focus our future strategic research directions.

There are diseases in other areas of our mandate that are much more predictable than



Finding solutions—Biosafety level 4 containment facility at the Canadian Science Centre for Human and Animal Health in Winnipeg/Canada

SARS, yet the research challenges are no less. While we are much further along in terms of diagnostics and treatment of HIV/AIDS and hepatitis C, we are far from a cure for HIV/AIDS and have so far been unable to stem the spread of the disease, with resulting social and economic impacts. The Institute of Infection and Immunity recognizes that a new research strategy is needed to increase the length and quality of life for HIV-infected individuals, to reduce disease transmission and progression and to improve treatment. Toward this end, the Institute is providing input to federal policy-makers on the need for increased investment in research on HIV/AIDS, and has created the CIHR HIV/AIDS Research Advisory Committee to set research priorities for CIHR. In the meantime, CIHR is supporting investigators – such as are featured in this newsletter – in all areas of HIV/AIDS research.

I hope you enjoy this edition of our newsletter, and I look forward to your comments.

**Dr. Bhagirath Singh, Ph.D.**

Scientific Director

CIHR Institute of Infection and Immunity (III)



Institut de recherche  
en santé du Canada

Canada

## What's New at III

### The Canadian SARS Research Consortium (CSRC)

The mandate of the CSRC is to coordinate, promote and support SARS research in Canada and develop international linkages and partnerships to control and eradicate SARS.

The Consortium consists of a Management Group (chaired by Dr. Bhagirath Singh), Scientific Advisory Committee, Executive Committee, and Research Team.

The CSRC is crafting a national research agenda on SARS in five broad research areas, each overseen by a theme leader with responsibilities including preparing a research inventory, establishing priorities and identifying funding opportunities. The five themes and their leaders are:

- Diagnostics – Frank Plummer
- Vaccines - Lorne Babiuk
- Epidemiology and Databases – Mark Loeb
- Public Health and Community Impact – Paul Gully
- Therapeutics – Lorne Tyrrell

**The Scientific Advisory Committee (SAC):** Co-chaired by Dr. Brett Finlay and Dr. Donald Low, the SAC incorporates membership from the research community in the five research areas. Its role is to advise the Management Group on research areas that should be supported through RFA, opportunities for international collaboration, and the coordination of research programs within Canada.

**The National SARS Research Team:** The team will consist of researchers funded by the Consortium and will form research action groups to address specific research areas and identify gaps in the national research agenda.

**For more information on the CSRC visit:**  
[www.cihr-irsc.gc.ca/e/institutes/iii/18845.shtml#7](http://www.cihr-irsc.gc.ca/e/institutes/iii/18845.shtml#7)

### Funding Opportunities

**Priority Announcement: Emerging Infectious Diseases**—This funding initiative is intended to encourage multi-disciplinary approaches to research in emerging infectious diseases including but not limited to West Nile virus and SARS. III invites applications in the areas of vaccine development, host immune responses and clinical outcomes to the regular operating grants competition. Grants are offered for up to three years at a maximum of \$150,000 per grant per year. Registrations are due according to regular grants program deadlines.

**For more information:**  
[www.cihr-irsc.gc.ca/e/services/19739.shtml#d](http://www.cihr-irsc.gc.ca/e/services/19739.shtml#d)

### Previously launched International Opportunity Program:

### **One-time Development/Planning Grants, One-time Collaborative Research Project Grants**

The International Opportunity Program was created to support Canadian researchers in developing or extending international collaborations in the CIHR and Institutes' priority areas of health research. Two types of one-time funding grants are available to researchers in different stages of international collaboration. These one-time grants will provide opportunities to participate in major international research projects, and access to cutting edge research and technologies that are not currently available in Canada.

### **For more information:**

<http://www.cihr-irsc.gc.ca/e/services/16479.shtml>

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## On the Web

*Research in Infection & Immunity*

New feature articles:



### Transnet

The holy grail of transplant research is tolerance. To learn how to tell the body to accept a transplanted organ as though it were its own, to limit or cease the use of immunosuppressants, and to save lives—such are the ultimate goals of Transnet, a research team that was successful in the 2002 Institute of Infection and Immunity Health Research Programs of Excellence (HRPE) grant competition. The program's microarray analysis central core is open for business and is performing research on innovation in organ and cell transplantation in collaboration with Transnet members across Canada.

#### For more information:

[www.cihr-irsc.gc.ca/e/institutes/iii/20005.shtml#?](http://www.cihr-irsc.gc.ca/e/institutes/iii/20005.shtml#?)

### Dr. Fantus

For a person with diabetes, the moderation of blood glucose is critical. Yet processes in the body conspire to prevent this moderation with effects that can be fatal if left untreated. Dr. George Fantus, principal investigator of a New Emerging Team sponsored by III along with JDRF and CIHR Institutes INMD and IHDCYH studying glucose toxicity, is working with team members to investigate glucose control and toxicity in order to counteract those effects.



#### For more information:

[www.cihr-irsc.gc.ca/e/institutes/iii/20001.shtml#?](http://www.cihr-irsc.gc.ca/e/institutes/iii/20001.shtml#?)

### Public Health and the Agriculture Rural Ecosystem

Rural communities face a unique array of health issues, many of them intertwined with environmental issues. Rural demographics are changing, increasing the need for research. Dr. James Dosman, director of the Institute of Agricultural Rural and Environmental Health at the University of Saskatchewan, is working with colleagues to build research capacity in these areas through a CIHR Strategic Training Program sponsored by III, along with CIHR Institutes ICR, ICRH and IPPH.

#### For more information:

[www.cihr-irsc.gc.ca/e/institutes/iii/19995.shtml#?](http://www.cihr-irsc.gc.ca/e/institutes/iii/19995.shtml#?)

## III Events

### Meeting the Health Challenge of Prion Diseases: International Research Conference

The CIHR Institute of Infection and Immunity in partnership with the CIHR Institute of Population and Public Health and Health Canada sponsored the international research conference Meeting the Challenge of Prion Diseases. Held in Edmonton, Alberta, at the Fairmont Hotel Macdonald on Thursday, September 25 and Friday, September 26, 2003, the conference brought together scientists, students, and health workers from universities, institutes, and governments in Canada, the United States, and Europe.

A working group met following the research conference to consult with stakeholders on how to enhance Canadian research opportunities and results related to prions and prion diseases. Participants included Canadian clinicians, researchers, decision makers, and an expert from the USA.

#### For more information:

[www.cihr-irsc.gc.ca/e/news/18755.shtml#?](http://www.cihr-irsc.gc.ca/e/news/18755.shtml#?)

### Integrating Discovery Platforms in Autoimmune Disease Research Symposium

Autoimmune diseases result from a dysfunction of the immune system in which the body attacks its own organs, tissues and cells. Physicians and scientists have identified more than 80 clinically distinct autoimmune diseases. On Thursday, December 4 and Friday December 5, 2003, the Institute hosted a symposium to evaluate the field of autoimmune diseases, with focus on basic mechanisms and commonalities among autoimmune diseases. Specific objectives of the symposium were:

- to identify strategic directions and mechanisms for translating biomedical research into better health for patients with autoimmune diseases
- to develop coordinated theme areas and research questions, for example, as the basis for CIHR-sponsored RFAs and for integration of autoimmune diseases into the CIHR longitudinal Canadian cohort study
- to develop a framework for collaboration and partnership among stakeholders in the autoimmune diseases community

#### For more information:

[www.cihr-irsc.gc.ca/e/institutes/iii/19225.shtml](http://www.cihr-irsc.gc.ca/e/institutes/iii/19225.shtml)

## Focus on Partnership

### Why is partnering important to CIHR?

The Canadian Institutes of Health Research is committed to fostering collaboration with organizations and health charities interested in both health and health research. The agency also engages voluntary and private sector organizations with complementary research interests in partnership and collaboration.

### How does the Institute of Infection and Immunity observe the CIHR commitment to partnership?

The Institute believes that partnerships increase the impact of research initiatives and extend available funding opportunities in addition to supporting the creation of new ones. We welcome partnerships as opportunities to develop wider relationships within the infection and immunity communities, and to increase the knowledge base supporting our initiatives. The Institute is involved in partnerships ranging from collaborations in specific areas to more broad collaborations including the Canadian Research Coalition for Safe Food and Water, the Canadian SARS Research Consortium and the CIHR HIV/AIDS Research Advisory Committee. To extend our partnerships even further and encourage collaboration among other organizations, we hosted a Partnership Forum in the winter of 2003 (see the Publications page on our website for the final report).

### Whom does the Institute of Infection and Immunity partner with?

Our partners range from federal – including other CIHR Institutes – and non-governmental organizations to the private and voluntary sectors, to industry, to international organizations (see page 5 for a list of partners).

### What do III partners contribute? Does it always have to be financial?

III recognizes that not all organizations have research budgets, and that there are many different ways of contributing to a partnership, including:

- expertise (i.e. in a clinical specialty)
- priority setting
- patient/client/consumer relationships
- communications, administrative or intellectual support
- equipment/facility or other resources



Ms Sonya Corkum, Vice-President, Partnership and Knowledge Translation, CIHR, talks with Mr. Wim Wolfs, Manager, Research Programs, Kidney Foundation of Canada during a breakout session with other members of Canada's volunteer organizations and professional societies at the CIHR Institute of Infection and Immunity Partnership Forum January 31 to February 1, 2003, in Toronto, Ont.

### Criteria for partnership

Participants in the III Partnership Forum identified an opportunity area for partnership as:

- contributing to the fields of infection and immunity
- addressing current issues related to these fields
- crossing at least two of the four CIHR pillars (biomedical research; clinical research; health systems, health services, and the health of populations; societal and cultural dimensions of health and environmental influences on health)
- multi-disciplinary
- national in scope

- Is your organization interested in or currently developing an initiative that could be enhanced through partnership?
- Do your organization's objectives overlap or complement III objectives in areas suited for partnership (i.e. capacity building)?
- Would the initiative benefit the stakeholders of both/all partnering organizations?

### Whom should we contact to discuss a partnership with III?

If you are interested in exploring partnership with III, please contact Bruce Moor at (519) 661-3228 or [bmoor@uwo.ca](mailto:bmoor@uwo.ca)



## Our Partners Include...

- Alberta Heritage Foundation for Medical Research
- Arthritis Society
- Canadian Bacterial Diseases Network
- Canadian Cystic Fibrosis Foundation
- Canadian Lung Association
- Canadian Network for Vaccines and Immunotherapeutics (CANVAC)
- Canadian Research Coalition for Safe Food and Water:
  - Agriculture and Agri-Food Canada
  - Canadian Agri-Food Research Council
  - Canadian Aquaculture Industry Alliance
  - Canadian Bacterial Diseases Network
  - Canadian Cattlemen's Association
  - Canadian Food Inspection Agency
  - Canadian Institutes of Health Research
  - Canadian Pork Council
  - Canadian Veterinary Medical Association
  - Canadian Water Network
  - Chicken Farmers of Canada
  - Dairy Farmers of Canada
  - Environment Canada
  - Genome Canada
  - Health Canada
  - National Research Council Canada
  - Natural Sciences and Engineering Research Council of Canada
- The Canadian Society of Transplantation
- Canadian Water Network
- CIHR Institutes
- Fonds de la recherche en santé du Québec
- Health Canada
- Heart and Stroke Foundation of Canada
- The Juvenile Diabetes Research Foundation
- Kidney Foundation of Canada
- Michael Smith Foundation for Health Research
- Natural Sciences and Engineering Research Council of Canada
- Ontario Research and Development Challenge Fund

## Dr. Abdallah Daar

**Bringing bioethics and technology to developing countries**



In an environment of rapidly developing technology in health research, Dr. Abdallah Daar's expertise as an internationally recognized expert in biotechnology and ethics ensures a packed schedule. An authority on issues including trafficking in transplanted organs, nanotechnology, cloning, and stem cells, his input and guidance are often sought by many beyond the Institute of Infection and Immunity, from national media to the World Health Organization.

From university in Uganda to medical school in London, England, to his current position at the University of Toronto (U of T), Dr. Daar has travelled through academic circles in more than one sense. Beginning with a background in immunology and human genetics, Daar says his clinical work interested him in transplantation ethics, and from there he moved on to genomics ethics. His U of T appointments include director of the Program in Applied Ethics and Biotechnology at the University of Toronto Joint Centre for Bioethics (JCB), professor in the Department of Public Health Sciences and the Department of Surgery. In this last specialty area, he holds the official world record for performing the youngest cadaveric donor kidney transplant.

While Dr. Daar is a resource for the Institute on ethical, legal and social issues affecting health research in infection and immunity, his central focus is studying how genomics and related cutting-edge technologies can be harnessed to improve the health of people in developing countries. Daar and U of T colleague Peter Singer are advocating that world governments narrow the genomics gap between industrialized and developing countries through a five-point strategy published in *Science* in October 2001.

Through major grants from Genome Canada, Daar was a central force in creating the JCB's Canadian Program on Genomics and Global Health (CPGGH), of which he is a program director. An October 2002 study published in *Nature Genetics* on the top 10 biotechnologies for improving health in developing countries is an example of the CPGGH's output.



*Report: Lessons from Ethical Choices in the  
Toronto SARS Outbreak*

Responding to important challenges raised by Toronto's handling of the SARS crisis, a team of experts - including Dr. Daar - from the University of Toronto Joint Centre for Bioethics (JCB) designed an ethical framework to guide policy makers and public health authorities worldwide through future infectious disease outbreaks. The report analyses key ethical challenges that confronted policy makers during the SARS emergency and presents recommendations for the future. The group was composed of nine experts in medical ethics who came from such disciplines as medicine, surgery, health law, social work, teaching, nursing, and epidemiology. A number of team members were working in directly affected hospitals, and some were in positions of authority during the outbreak.

**The report is available online at:**  
[http://www.utoronto.ca/jcb/SARS\\_workingpaper.asp](http://www.utoronto.ca/jcb/SARS_workingpaper.asp)

**The Institute Advisory Board...**  
**They make it possible**

The Institute would like to welcome new members to its advisory board:

**Dr. Joseph Cox**, Montreal Regional Public Health Department and McGill University

**Dr. Warren Hill**, Canadian Viral Hepatitis Network and BC Centre for Disease Control

**Dr. Mark Loeb**, Department of Pathology and Molecular Medicine, McMaster University

**Dr. Marc Ouellette**, Département de biologie médicale, Université Laval

**Dr. Kevork Peltekian**, Department of Medicine, Dalhousie University

**Dr. Tania Watts**, Department of Immunology, University of Toronto

The Institute would like to thank retiring board members **Dr. Noni MacDonald**, **Dr. Danielle Malo**, **Dr. Steffanie Strathdee** and **Dr. Robyn Tamblyn** for their dedication and contributions.



Karl Tibelius (CIHR), Jennifer Gunning (CIHR), and Dr. Ted Myers at the Canadian Association for HIV Research 2003 conference.

## HIV/AIDS : Issues of infection and Immunity

From the outset, supporting research on HIV/AIDS has been a strategic priority for the Institute and for CIHR. CIHR is a partner in Health Canada's Canadian Strategy on HIV/AIDS (CSHA), and manages the recently renewed Clinical Trials Network (CTN) component of the strategy.

Health Canada and its partners in the CSHA are developing a five-year strategic plan for Canada to address the continuing epidemic, while the Parliamentary Standing Committee on Health released a June 2003 report on the CSHA containing seven recommendations for its success. III Scientific Director Dr. Bhagirath Singh served as a witness for the Standing Committee on behalf of the Institute during the preparation of the report.

The report highlights that funding for the Canadian Strategy on HIV/AIDS has remained at \$42.2 million since 1993, and recommends an increase to \$100 million annually. In addition, specific roles for CIHR are recommended, including allocation for research into non-pharmaceutical alternatives for prevention and treatment, and gender and cultural issues of HIV/AIDS.

The Institute's launch of an RFA on Social and Behavioural Research Issues in HIV/AIDS and Hepatitis C is in alignment with these recommendations. The Institute has also created the CIHR HIV/AIDS Research Advisory Committee (CHARAC) to assist CIHR in determining research priorities. The committee members represent five CIHR Institutes, Health Canada, the Ministerial Council on HIV/AIDS, and the HIV/AIDS research and volunteer communities.

Through the Institute of Infection and Immunity, the committee will advise the Research Priorities and Planning Committee of CIHR (composed of 13 Institute



Scientific Directors, four CIHR Vice-Presidents and chaired by the President), regarding research priorities for HIV/AIDS to aid in the development of future RFA.

For more information on the Parliamentary Standing Committee on Health report, **Strengthening the Canadian Strategy on HIV/AIDS:**

[www.parl.gc.ca/InfoComDoc/37/2/HEAL/Studies/Reports/healrp03-e.htm](http://www.parl.gc.ca/InfoComDoc/37/2/HEAL/Studies/Reports/healrp03-e.htm)

## Dr. Ken Rosenthal

### Plumbing the secrets of immunity in search of an AIDS vaccine



Dr. Ken Rosenthal

For many, protection against infection with the human immunodeficiency virus can be achieved through simple measures. However, the spread of HIV shows no signs of abating, and appears in fact to be increasing. In this environment, there are many keen observers watching vaccine researcher Dr. Ken Rosenthal, who is leading efforts to refine

delivery methods and maximize effects on immunity of a vaccine that has successfully protected mice from infection with HIV. The HIV virus is, like most retro- (RNA) viruses, highly mutable.

Rosenthal, Professor of Pathology and Molecular Medicine at McMaster University, points out that the body's mucous membranes are staging grounds for infection. "Almost all the pathogens that infect us enter the body through contaminated air, through contaminated food or water, or they're sexually transmitted – so most pathogens start infection at the mucous membranes." Because the spread of HIV is primarily through sexual contact, strong and long-lasting mucosal immune responses are vitally important, says Rosenthal.

It's a point that has been proven by a population of Nairobi sex workers that remain HIV-negative despite repeated exposure to the virus. This research was pioneered by Dr. Frank Plummer, a member of the Institute Advisory Board and Scientific Director of the National Microbiology Laboratory of Health Canada. Studies have revealed that these women

have a unique population of normal antibodies called immunoglobulin A (IgA) that can neutralize the HIV virus in the genital tract. IgA is an example of the singular properties of mucosal immunity: the antibody is a first-responder to infection of the lung, intestine, mouth, and urogenital tract. "One of the most exciting findings has been that IgA molecules might be able to stop HIV from crossing the genital epithelium," says Rosenthal.

McMaster scientists have a history of research on mucosal immunity. Rosenthal says researchers studying the lungs, the gut and the genital tract were organized to form the CIHR Group on Mucosal Immunity which received a five-year group grant. The formation of the group facilitates the comparison of immunity at the different mucosal sites, says Rosenthal, who leads the group. "By linking up, it allows us to synergize – because each lab is using different techniques or asking different questions."

Rosenthal, past president of the Canadian Association for HIV Research, believes leadership in the area of HIV/AIDS research both nationally and internationally has been lacking in Canada, and says he was "very pleased" to see that III is moving forward with the CIHR HIV/AIDS Research Advisory Committee.



- **HIV/AIDS has killed more than 20 million people worldwide since being clinically observed in 1981.**
- **Of 42 million worldwide living with HIV, 30 million dwell in sub-Saharan Africa.**
- **New HIV diagnoses in gay and bisexual men in the U.S. have jumped 18% since 1999.**
- **Between 2000 and 2002, the number of positive HIV tests reported in Canada increased by 17 per cent.**
- **Of three variants of the disease (HIV-1, HIV-2, HIV type O), HIV-1 is the most common – and the most aggressive – worldwide.**



## Results of the "Host Response to Severe Acute Respiratory Syndrome (SARS) " Request for Proposals Competition



SARS Virus

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The CIHR Institute of Infection and Immunity, in partnership with Ontario Research and Development Challenge Fund (ORDCF), Canadian Network for Vaccines and Immunotherapeutics (CANVAC) and Le Fonds de la recherche en santé du Québec (FRSQ), is pleased to announce the results of the competition under the CIHR-III request for proposals (RFP) "Host Response to Severe Acute Respiratory Syndrome (SARS)".

A total of 18 applications were submitted in April 2003 and subsequently reviewed by a peer review committee assembled for this RFP.

### Successful teams:

#### Severe Acute Respiratory Syndrome (SARS)

Principal Investigator	Research Organization	Research Focus
Dr. Mark Loeb	McMaster University	To improve understanding of the diagnosis, clinical course, epidemiology and immunopathogenesis of SARS
Dr. Danuta Skowronski	BC Centre for Disease Control, University of British Columbia	To carry out research leading to the development of a vaccine for SARS
Dr. James Dennis	Samuel Lunenfeld Research Institute, University of Toronto	To examine methods to monitor infection and host response to the SARS virus
Dr. Michel Bergeron	Centre hospitalier de l'Université Laval	To pursue a rapid diagnostic test for SARS

### Institute Advisory Board

**Dr. Lorne A. Babiuk** *University of Saskatchewan (Chair)*  
**Dr. Michel G. Bergeron** *Laval University*  
**Dr. Chris Bleackley** *University of Alberta*  
**Dr. Joe Cox** *McGill University*  
**Dr. Abdallah Daar** *University of Toronto*  
**Dr. B. Brett Finlay** *University of British Columbia*  
**Dr. Jack Gauldie** *McMaster University*  
**Dr. Kevin Glasgow** *McMaster University*

**Dr. Warren Hill** *BC Centre for Disease Control*  
**Dr. Mark Loeb** *McMaster University*  
**Dr. Marc Ouellette** *Laval University*  
**Dr. William E. Paul** *National Institutes of Health (U.S.)*  
**Dr. Kevork Peltokian** *Dalhousie University*  
**Dr. Francis Plummer** *Health Canada, National Microbiology Laboratory*  
**Ms. Helaine Shiff** *Juvenile Diabetes Research Foundation*  
**Dr. Tania Watts** *University of Toronto*

Read more on the IAB at : <http://www.cihr-irsc.gc.ca/e/institutes/iii/13535.shtml#?>